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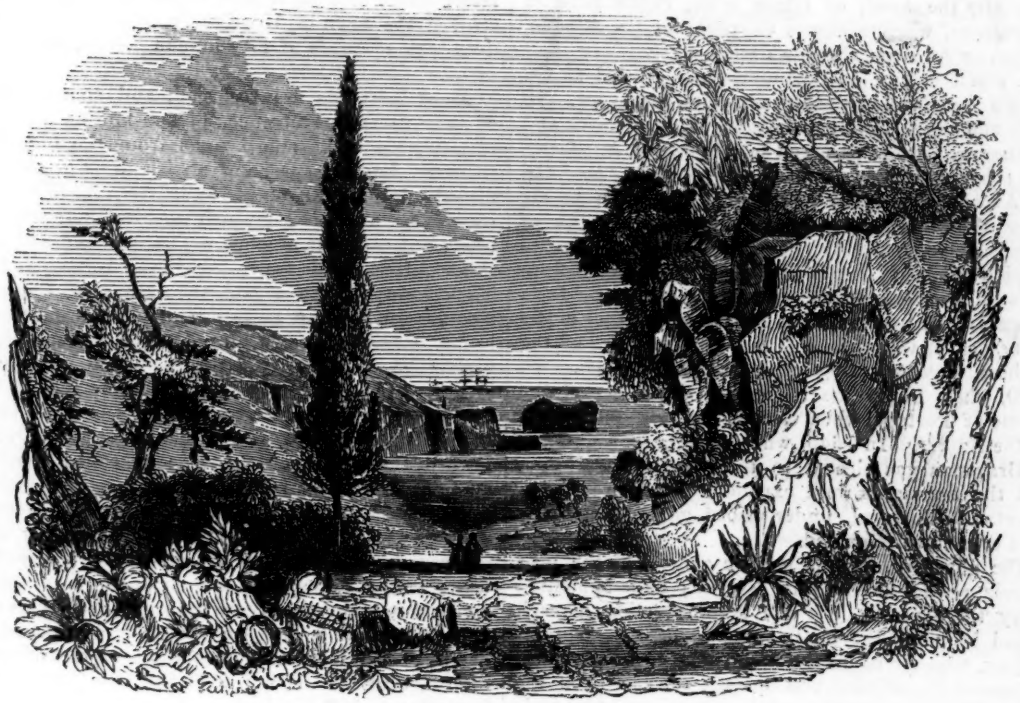
THE AZORES, OR WESTERN ISLES.



VIEW IN ST. MICHAEL'S.

No. I.
ST. MICHAEL'S.

Bear me Pomona! to thy citron groves;
To where the lemon and the piercing lime,
With the deep orange glowing through the green
Their lighter glories blend.—Thomson.

Did the reader, while enjoying one of nature's most delicious fruits, the orange, ever carry his thoughts to those beautiful islands, where "the orange flower perfumes the bower," and desire to know something of the locality, the growth, and natural properties of the wholesome production which is so abundantly supplied to him? "Fine St. Michael oranges," is the cry which, during the orange season so frequently greets the ears of the passenger in the streets of London. Our fruit-shops, fruit-stalls, and hawkers, are so abundantly supplied with this golden production of nature, that we should suppose almost every one who loves an orange (and who does not?) is either well acquainted with, or would wish to receive, the information we are now about to supply.

But it happens in this, as in many other cases, that an object which is brought so constantly before us ceases to interest us; while that which is new and strange excites our liveliest curiosity. "Where is St. Michael's, mama, where the oranges come from?" said a little girl to her mother. "In Cornwall, my dear; they grow upon St. Michael's Mount!" was the answer. In fact, so little has been written about the islands among which that of St. Michael is situated, that more persons than one are likely to mistake St. Michael's, in Cornwall, for the island of the same name in the North Atlantic Ocean.

The Azores, or Western isles, are situated in the Atlantic about eight hundred miles to the west of Portugal, to which country they belong. They form three groups, of which the central is the most important, and consists of five islands, namely, Terceira, St. George, Pico, Fayal, and Graciosa. These islands are sometimes called the Terceiras. About a hundred miles to the north-west lie the small islands of Flores and Corvo: and about sixty miles E.S.E. from the Terceira group are the islands of St. Michael and St. Mary.

All these nine islands are included in the general term Azores, or the *Western isles*, as the English usually term them. They were first visited by the Arabian navigators, and described by their geographers, as may be seen in the manuscript charts of the fourteenth century; but they seem to have been rediscovered by a navigator of Bruges named Vanderberg, about the year 1431. He was sailing for Lisbon, and being driven far west by a storm, noticed these islands; and having afterwards arrived in the Tagus and mentioned his accidental discovery, the Portuguese, at that time an active and enterprising people, sent off Gonsalvo Velho Cabral on a voyage of discovery. In the following year Cabral discovered the island of St. Mary, which he so named, and in the course of time the other islands of this Archipelago were discovered.

The island of St. Michael's was discovered in May 1444, by a prisoner in St. Mary's, who, having broken loose, fled to the mountains, and while there observed, one fine evening at sun-set, the high peaks of this island rising like pyramids out of the sea, to the north-west. In hopes of pardon he returned home, and made this discovery to Cabral, who forgave him, and immediately set out on another voyage of discovery. All these islands, when first visited, were found to be entirely uninhabited by man or any animals, except birds, which were very numerous, especially the *hawk*, or falcon tribe, called Açor in Portuguese, whence comes the name of the islands, *Açores*, or AZORES, the hawk islands.

A small colony of Portuguese was settled at St. Mary's by Cabral, shortly after its discovery. In 1443 and the following year, some African slaves and Portuguese settlers prepared to colonize St. Michael's. The other groups were gradually peopled. In 1446 the Azores were given by Alfonso the Fifth to his sister the Duchess of Burgundy and Regent of Flanders, when many Flemish settlers helped to people the island; and their descendants are still to be found therein. This circumstance caused the term Azores to be exchanged for a time for that of *Os Flamengos*, or the *Flemish Isles*. On the death of the duchess, however, they reverted to Portugal. In 1580, when Philip the Second of Spain seized the throne of Portugal then vacant, he took possession of the Azores. In 1640, when the present dynasty of Braganza was elected to the throne of Portugal, and the Spaniards were expelled, the Azores again reverted to Portugal, under whose government they have ever since remained.

The governor, who is captain-general of the nine islands, resides at Angra in Terceira; he is appointed every three years: but the administration of each island is under the control of one or two captain-majors, who attend to the maintenance of the police, command the militia, and inspect the receipt of the taxes. The two forts of Angra have separate commandants; but the islands are, upon the whole, in a bad state of defence. The bishop resides at St. Michael's.

The Azores, geologically considered, seem to be of comparatively recent sub-marine volcanic formation, symptoms of which are everywhere apparent by the actual condition of the surface, which bears constant marks of being formed by the violent and terrific agency of fire.

By these tremendous means, (says Captain Boid,) all the islands have been at various unknown periods forced up from the sea. From this general rule, however, may be excepted that of Santa Maria,—which, although it has, like the rest of the Azores, been forced above the level of the sea by volcanic action, nowhere bears traces of the effects of fire on its surface.

The effects of these awfully sublime movements of nature give rise to appearances, on the face of a country, of the most peculiar kind; and nothing can be more interesting than the characteristics of these islands. Their general aspect is picturesque and bold. They, for the most part, present an irregular succession of isolated conical, or cacuminated, hills, with table-lands rising from two to five thousand feet in height; the former being separated by valleys, the latter stratified and intersected with tremendous ravines and deep chasms formed by the operation of rain over the softer volcanic materials composing the mountains; the whole is almost invariably bounded by magnificent mural precipices rising abruptly from the sea, and frequently rendered inaccessible by soft, crumbling lava, and masses of loose tuff of which they are formed.

There do not seem at present to be any volcanoes or craters which are in action; but there are many which are extinct, varying from fifty to twenty thousand feet in depth. There are fountains of boiling water, and impetuous gushes of hot sulphureous vapours of frequent occurrence, and most of the islands are subject to earthquakes.

A volcanic eruption of a dreadful character is recorded as having occurred in 1591. It lasted twelve days, and destroyed the flourishing town of Villa Franca in the island of St. Michael. An eruption also occurred in the island of St. George, so recently as 1808. An enormous crater was heaved up rapidly to the height of 3500 feet in the centre of the island; and within four days, more than a dozen small craters opened round the principal one. The eruption lasted about five days, and ceased after having destroyed the town of Ursuline, a number of country dwellings, upwards of fifty human beings, and much cattle.

Many instances are recorded, and some of them of very recent occurrence, of sub-marine volcanoes throwing up rocks and islands from the bottom of the sea. Kircher speaks of an island of great magnitude being thrown up in 1538, fifteen leagues to the west of St. Michael's, "which remained unaltered for many years, and then suddenly disappeared and sank to an unfathomable depth." In 1691 numerous little islets were uplifted round the shores of the same island. In 1719, a large circular island nine miles in diameter was thrown up, which disappeared in the year 1723, sinking from the surface to a depth of seventy fathoms. Again, in 1811, on the 13th of June and at the same place, (off the west of St. Michael's,) occurred the volcanic eruption which formed the island of Sabrina: so called from the name of an English man-of-war at that time cruising in the neighbourhood, and whose crew actually watched the rapid formation of the island. It commenced by the ejection of enormous columns of water, smoke, and stones, accompanied by sub-marine explosions. On the 18th the summit of the crater appeared above water; on the 20th it attained the height of 180 feet; and on the 4th of the following month, when the eruption ceased, the island, thus formed, was 300 feet high, and a quarter of a league in circumference; the little crater of which contained a basin of boiling water. All, however, entirely disappeared about the middle of October, and sank to a great depth in the bosom of the ocean.

But the only *sub-marine* volcano which has been satisfactorily observed, is that near the island of St. Michael. It was during a violent earthquake in 1638 that flames and puffs of smoke were seen to arise from the agitated sea. This vast fire extended over a space of several acres; earthy matters and masses of rock were tossed into the air and fell into the sea, upon which they floated. By degrees all these masses were re-united, covering a space of three leagues in length, and half a league in breadth. These eruptions continued during three weeks; all these rocks raised above the sea then disappeared, without a trace being left. The fishermen, witnesses of this catastrophe, took fragments of the rocks ejected from the sea; they burst with a noise, and left nothing but a blackish gravel, which was scoria and volcanic tuff. The crater of the volcano had afforded shelter to great numbers of fish. It was the ordinary rendezvous of the island-fishermen; and at the time of the eruption, the sea ejected so many dead fish, that the air became infected by them. But the most ancient and permanent volcano-mountain is that in the island of Pico, which is about seven thousand feet high, and in the form of a sugar-loaf. It is visible in clear weather, at a distance of ninety miles.

These islands abound with a great variety of mineral waters of the most valuable qualities and temperature,—

And which alone, (says Captain Boid,) might be rendered a source of wealth to the inhabitants, if the condition of the country and the accommodations of life were such as to induce visiters to resort thither to profit by their beneficial effects. Amongst the most valuable, curious, and extensive, are those of the Val das Furnas and Ribiere Grande, in the island of St. Michael; those of Euxofra, near Angra, in the island of Terceira; and at Pico and Flores. The maximum heat of these springs is about five degrees beyond boiling-point, which serves to prove the permanent activity of the subterranean fires. They are rationally supposed also either to prevent earthquakes that otherwise would occur, or to diminish their destructive power by the heated vapours incessantly thrown off to an incalculable extent from these numerous vents.

These *caldeiras*, or *boiling springs*, rise in some parts in columns to the height of ten or twelve feet; they are of various diameters, and the burning vapours resulting from them are formed into clouds, which exhibit a variety of fantastic figures and brilliant tints. The water will boil an egg in two minutes; and the air smells strongly of sulphur, while suffocating mists issue from various crevices. Not far from the caldeiras of St. Michael is the Muddy Crater, a vast cavern filled with mineral substances in a state of constant ebullition, and making a noise equal to that of the sea beating on the shingles.

Amid all these turbulent elements, the scenery of the Azores is extremely beautiful, and the soil is fertile. The air and climate are more mild and agreeable than in any of the countries of Europe, which have the same latitude; and the cold is never so great as to make it necessary to warm the apartments. People afflicted with pulmonary complaints find great benefit in visiting these islands, on account of their more equable temperature. The mountain-slopes are planted with vines, oranges, and lemons; while the rich soil of the valleys is favourable to the growth of all sorts of grain, pulse, and vegetables. Cattle also abound, and these islands are said to furnish some of the best beef in the Old World. Sheep are bred chiefly for the sake of the wool; these islanders not relishing the taste of mutton. Goats and pigs are so numerous as to interrupt the progress of the pedestrian in the streets. Horses are of a small and inferior breed, but asses abound: these, together with bullocks, are usually employed as beasts of burden. All the domestic birds of Europe, and all sorts of game are plentiful. The real canary is one of their singing-birds, which, with many other species of warblers in innumerable quantities raise a loud and enchanting harmony early in the morning and after sun-set. They are well supplied with fish; and the adjacent seas abound with the spermaceti whale, and other oleaginous species; while the coasts of each island produce prodigious quantities of all sorts, calculated to supply the demands of the poor, and to gratify the delicate palates of the rich.

In the insect tribe (says Captain Boid), the most profitable are the bee, the silk-worm, and the cochineal: the honey of the former, however, is of inferior quality, as is supposed on account of the facility with which these little animals procure food from the abundant flowers throughout the year; but the two latter, if under the influence of industry, would prove an immense source of riches to the islands. The most obnoxious insects are flies, gnats, bugs, and fleas, which, during the warm season, infest houses in a most extraordinary degree, the two last arising from the habitual filth and neglect of the inhabitants. If we except the little creatures just named, the islands are free from venomous animals of any sort.

The moral condition of the people may be tolerably well estimated, when we take into consideration the nature of the government of their mother-country, Portugal; under whose auspices, bigotry and indolence were universally fostered. Hence resulted such excessive ignorance, that the commonest rudiments of literature, we are told, had all but disappeared from some of the islands. A new judge having been appointed in the island of St. Mary, thought it desirable to begin, as soon as possible, the amendment of some abuses which he saw was required. He accordingly issued a decree to that effect, and gave orders that it might be stuck up in different parts of the town, for general inspection. But one of his brothers in office, who better knew the literary capacity of the people, told him that such a mode of communication was quite useless, and might just as well be in Hebrew or Arabic; for there were only two women and one man in the whole island that could read!

People of property, and those in business, both men and women, imitate the English in dress. The customs at table are similar to those which are observed in Portugal: all the different articles of food are handed round in separate plates or dishes one after another; the guests help themselves, the cloth is kept on the table till the company rises, and very little wine is taken after dinner.

A future article on the Azores will be chiefly devoted to its botanical productions, and more particularly the ORANGE.

THE slave of pleasure soon sinks into a kind of voluptuous dotage; intoxicated with present delights, and careless of everything else, his days and his nights glide away in luxury or vice, and he has no care, but to keep thought away: for thought is troublesome to *him*, who lives without his own approbation.—DR. JOHNSON.

IT is singular that minor motives should often produce a powerful effect, which is looked for in vain from the highest and the best. Let those who speculate on human nature, and its endless inconsistencies, solve the enigma. A conviction of duty, of responsibility,—the delight of increasing the happiness of others, the policy of guarding our own, how often are they all insufficient to restrain the ebullitions, or to regulate the infirmities of temper; but strange to tell, the elephant, who could trample down an armed host, permits himself to be led by a little child—the faults over which a sense of duty to God have no power, yield to a sense of decorum.

There are persons, indeed, who, on the subject of temper, plead a sort of prescriptive right to indulgence, on the ground of constitutional infirmity or hereditary entailment, but before such pleas can be considered valid in the court of conscience, let them say whether there are no circumstances sufficiently powerful, whether there is no presence sufficiently august, to awe them into self-control—whether, in certain moments of their lives, they have not found the most indignant feelings controllable, the fiercest blaze of passion repressible.

If this be the case, and experience attests the fact, the plea of necessity falls to the ground; and can they forget, that in every moment of their lives they are in a presence the most august, under the vigilant observation of that mighty being, compared to whose glance the gaze of an assembled world is powerless and insignificant?

This is the avowed theory of numbers, who scruple not to darken and trouble the stream of life by capricious waywardness, or unrestrained irritability,—who shed, without remorse, the bitterest drops into the crystal cup of domestic happiness.—*Private Life.*

COTTON constitutes a very important article in the commerce of the Pasha of Egypt. A few years ago the cotton-tree, which had been cultivated to so great an extent by the ancient Egyptians, was only known as an ornamental shrub in the gardens of Cairo. The Pasha, however, learning its valuable properties, caused several experimental plantations to be made, and, these succeeding, turned his attention to its cultivation on a large scale. Two thousand fedans were planted in the provinces of Kelioub, Sharkiah, and Mansourah; and still more extensive plantations were afterwards made in various parts of Upper Egypt.—ST. JOHN'S *Egypt.*

ENGLAND IN THE OLDEN TIME.

No. IX.

MINSTRELS, JUGGLERS, AND DANCERS. 1.

AMONG the pastimes which high and low loved to visit and to applaud during several centuries in England, were exhibitions in which singing, dancing, tumbling, and juggling were more or less combined. How far the taste for these matters has decreased in our own day we need not say: we shall confine ourselves to by-gone ages, taking the industrious antiquary Strutt as our principal guide.

Early English minstrels were called by different names at different periods: thus we had the British bards, the northern scalds, and the Anglo-Saxon gleemen. The bards celebrated the noble actions of illustrious persons in heroic poems, which they sang to the sound of the lyre. According to Diodorus, "sometimes when two armies were standing in order of battle, with their swords drawn, and their lances extended, upon the point of engaging in a most furious conflict, the bards have stepped in between them, and by their soft and fascinating songs, calmed the fury of the warriors, and prevented the bloodshed." The *scalds* were the bards of Norway, and other northern nations, and were held in as much estimation as the bards among the Britons.

When the Saxons settled in England, the bards became separated into two classes, the *gleemen* or merry-makers, and the *harpers*, or musicians. The gleemen united mimicry and other modes of exciting mirth, to their profession, as well as dancing and tumbling, with sleights of hand and various deceptions. It was therefore desirable for them to associate themselves into companies, by which means they were enabled to diversify their performances, and act as confederates to one another.

In the Anglo-Saxon manuscripts there are many representations of the feats of the gleemen, of which the above cut is one. We here see two persons dancing to the music of instruments that may be called a horn and a trumpet. If the dancers are as tall as the musicians, which was probably the case, their attitudes must be somewhat peculiar, and not without difficulty.

The bards and scalds most probably availed themselves of the harp, to accompany their songs, and modulate their voices. The Saxon gleemen and jugglers did the same, but at the same time it appears that they were equally well acquainted with instruments that more or less resembled violins, flutes, horns, trumpets, and tabors. But the harp was the most popular, and was frequently exercised by persons who did not follow the profession of gleemen. As early as the seventh century, it was customary at convivial meetings to hand a harp from one person to another, and every one who partook of the festivity played upon it in his turn, singing a song to the music.

In a manuscript of the tenth century there is a representation of an Anglo-Saxon gleeman, or juggler, throwing up three balls, and three knives, and catching them alternately. We see therefore that *Ramo Samee* has been anticipated by at least eight hundred years. The gleeman is accompanied by a musician, playing on a kind of violin. Both are represented in the cut at the end of the present article. The feat of throwing up a number of sharp instruments into the air, and catching them alternately in their fall, was not entirely confined to the gleemen. It is said of Olaf Fryggeson, one of the early kings of Norway, that he could play with three darts at once, tossing them in the air, and always kept two up while the third was in his hand.

Dancing likewise formed part of the gleemen's exploits. In an old manuscript is a representation of a young man dancing to the music of two pipes and a lyre. In another there is a female dancing, and at the same time approaching to, and receding from, a bear, who is held by a keeper, but is unmuzzled. Another kind of dance was the *sword-dance*, which was practised as well by the Anglo-Saxons as by the Germans, and of which Tacitus thus speaks, with reference to the latter:—"One public diversion was constantly exhibited at all their meetings: young men who, by frequent exercise, have attained to great perfection in that pastime, strip themselves, and dance among the points of swords and spears, with wonderful agility, and even with the most elegant and graceful motions. They do not perform this dance for hire, but for the entertainment of the spectators, esteeming their applause a sufficient reward." Strutt has described a drawing, representing two men, equipped in martial habits, and each of them armed with a sword and a shield, engaged in a mock combat. The performance is enlivened by the sound of a horn: the musician acts in a double capacity, and is, together with a female assistant, dancing round them to the cadence of the music.

To go now to the times of the Normans, we find most of the before-mentioned feats continued, with some modifications, either in name or method. The gleemen changed their name to *minstrels*, and filled the multifarious offices of rhymers, singers, story-tellers, jugglers, buffoons, and poets. The *troubadours* (minne, or love-singers, as they are sometimes called) were a superior sort of rhymers, who originated in the south of France, and who composed songs of a chivalric nature. Kings, knights, and ladies delighted in them, and there is a story of Blondel, troubadour to Richard Cœur de Lion, which shows the intimate connexion which existed between them. Richard, after one of the Crusades, was confined in a castle belonging to the Duke of Austria. Blondel, who was in England, hearing no news of his master, feared that ill had befallen him, and determined to travel till he found him. After much vain search he arrived at a small town, near which was a castle belonging to the Duke of Austria; and having learned from his host that there was a prisoner at the castle, who had been confined for upwards of a year, he went to it, and cultivated an acquaintance with the keepers. But he could neither see the prisoner, nor learn any particulars of him: he therefore placed himself near a window belonging to the tower which contained the

prisoner, and sang a few verses of a song which had been composed conjointly by him and his patron. The king, hearing the first part of the song, repeated the second, which convinced the poet that the prisoner was no other than Richard himself. Hastening, therefore, to England, he acquainted the barons with his adventure, and they, by means of a large sum of money, procured the liberation of their sovereign.

It is however of persons of a lower grade than the troubadours that we are here treating. One such we have said was called a story-teller. An old manuscript states that one of our kings used to keep a story-teller, on purpose to lull him to sleep every night; but some untoward accident having prevented him from taking his repose so readily as usual, he desired the fabulator to tell him longer stories. He obeyed, and began one upon a more extensive scale, and fell asleep himself in the midst of it.

These story-tellers and jesters used to frequent alehouses, and sometimes even the houses of the great, and exhibit their drollery, for what remuneration they could obtain. Besides these, the Norman earls and great barons, who in their castles emulated the pomp and state of royalty, had their poets and minstrels: they formed part of their household establishment, and, exclusive of their wages, were provided with board, lodging, and clothing, by their patrons, and frequently travelled with them when they went from home. Other minstrels were their own masters, and went from castle to castle, from palace to monastery, to perform. They got so much into favour, that they grew impudent, and claimed as a right that which they had hitherto received as a gratuity, and settled its amount according to the estimate which they had formed of their own abilities. This increased so much that it was found necessary to give them a legislative check, about the year 1300.

There was, at the same period, a class of minstrels called *Tregetours*, who appear to have been a sort of conjurors, and whose business was to deceive the eyes of spectators, and produce such illusions as might be supposed to be the effect of enchantment. One of them professed, "by steeping a thread in the liquor produced from snake's eggs bruised, and by hanging it up over a basin of water, to produce water enough in a large hall for boats to row up and down in it." Some would "bring in the similitude of a grim lion, or make flowers spring up as in a meadow;" some would "cause a vine to flourish, bearing white and red grapes, or show a castle built with stone; and when they please, cause the whole to disappear." Sometimes these conjurors exhibited in a room, and at others, on a table, or on a scaffold erected for their use. We shall have to speak more of these conjurors hereafter.

Tumbling was one of the exploits of the jugglers or minstrels. There was a tumbler, in the reign of Edward the Second, who rode before his majesty, and frequently fell from his horse in such a manner that the king was highly diverted, and laughed heartily, and rewarded the performer with the sum of twenty shillings, a considerable sum in those days. There is in one of the Sloane manuscripts a picture of a performer, tumbling over head and heels, another spinning round a basin on the top of a stick, and a third playing the pipe and tabor. In another manuscript there is a representation of a man walking and playing on the bagpipes, with a girl dancing on his shoulders. This appears to have occurred in the thirteenth century.

Other rude drawings of the period represent different feats of balancing. In one there is a girl, habited like a boy, and kneeling on a large broad board, supported horizontally by two men; before her are three swords, the points inclined to each other, and placed in a triangular form: she is pointing to them with her right hand, and holds in her left a small instrument, somewhat resembling a trowel. In another drawing a man is represented as having placed a sword upright on its hilt, and is in the act of doing so with a second sword. In a third instance a man is balancing a sword on the point of his finger, and in a fourth another performer is balancing a coach-wheel on his shoulder. All these are in manuscripts of the fourteenth century, and so is another, in which the performer is balancing a spear on his nose, and holding up his left foot in his right hand.

We have now brought down our notice of these various exhibitors to the fourteenth century, and shall continue it to later periods in the next article.

THE LOVE OF FLOWERS.

The love of flowers seems a naturally-implanted passion, without any alloy or debasing object as a motive; the cottage has its pink, its rose, its polyanthus,—the village its geranium, its dahlia, and its clematis; we cherish them in youth, we admire them in declining days; but, perhaps, it is the early flowers of spring that always bring with them the greatest degree of pleasure, and our affections seem immediately to expand at the sight of the first opening blossom under the sunny wall or sheltered bank, however humble its race may be. In the long and sober months of winter our love of nature, like the buds of vegetation, seems closed and torpid: but, like them, it unfolds and re-animates with the opening year, and we welcome our long-lost associates with a cordiality that no other season can excite, as friends in a foreign clime. The violet of autumn is greeted with none of the love with which we hail the violet of spring,—it is unseasonable; perhaps it brings with it rather a thought of melancholy than of joy; we view it with curiosity, not affection: and thus the late is not like the early rose. It is not intrinsic beauty or splendour that so charms us, for the fair maids of spring cannot compete with the grandeur of matrons of the advanced year; they would be unheeded, perhaps lost, in the rosy bowers of summer and autumn. No, it is our first meeting with a long-lost friend, the reviving glow of a natural affection, that so warms us at this season; to maturity they give pleasure, as a harbinger of the renewal of life, a signal of awakening nature, or of a higher promise; to youth they are expanding, being opening year's hilarity; and the child, let loose from the house, riots in the flowery mead, and is

"Monarch over all he surveys."

There is not a prettier emblem of spring than an infant sporting in the sunny field, with its osier basket wreathed with buttercups, orchises, and daisies. With summer flowers we seem to live as with our neighbours—in harmony and good will; but spring flowers are cherished as private friendships.

RHUBARB.

FAMILIAR as we may be with the name and properties of this plant, we are yet ignorant of the source from whence we derive *true rhubarb*. Many endeavours have been made to discover the precise species which yields this valuable medicine. The countries from which we receive it have been visited with express reference to this object, and much attention has been bestowed on the culture of the different known species, and on the comparison of their roots with the rhubarb of the shops; but these attempts have hitherto proved entirely unsuccessful, nor is it surprising that such should have been the result, when we consider that the labour and difficulty of penetrating into the country where the true rhubarb is supposed to grow, must necessarily be great; while the jealousy of those who have hitherto found it a profitable article of commerce, is sure to lay many obstacles in the way of discovery.

Rhubarb has been in use, as a medicine, for centuries, and until the year 1732 it was believed to be yielded by the species *rheum raponticum*, Linn., so generally cultivated in our gardens for the sake of the leaf-stalks, the agreeable acidity of which, owing to their containing, in common with other plants of the same natural order, a portion of oxalic acid, has brought them into extensive requisition for making tarts and preserves. But the roots of this latter species are found to yield a product very little resembling the true rhubarb, and its cultivation for medicinal purposes has long been abandoned. This species is distinguished by the leaves being roundish ovate, obtuse, pale green, with a few hairs beneath on the nerves and margins. The roots are large and thick, and like those of most of the other species, reddish brown without, and yellow within.

In 1732 some seeds were planted at Paris and Chelsea, as those of the true Rhubarb, but they produced the species *rheum undulatum*, distinguished by its dark green, extremely wavy leaves, and by the redness of its footstalks, the roots of which also differ widely from those of the genuine drug.

Some seeds were obtained by Kaan Boërhaave, in 1750, which produced both *rheum undulatum* and *rheum palmatum*, the latter of which approaches more nearly to the true plant in the colour, taste, and smell of the root, than any other. The leaves of this plant distinguish it from all the other species: they are palmated, with acuminate segments; and though the Bucharian rhubarb merchants know nothing of such a leaf as that of rheum palmatum, and always describe the true rhubarb plant as having round leaves, with waved edges, yet the idea that the plant raised by Boërhaave is the genuine one, has been, and is still, extensively entertained.

In 1790 an apothecary, of the name of Sievers, was sent into Siberia by Catherine the Second of Russia, for the purpose of penetrating, if possible, into the rhubarb country, and of ascertaining the true plant; but after four years' ineffectual effort, he returned with no further information than had been before obtained on the subject. From that time to the present no further attempts seem to have been made to discover the source of true rhubarb, so that a subject of investigation is left open to the scientific botanist, which is well worthy his attention.

Though this plant has not been seen by any scientific person, yet some interesting information has been gathered from the reports of other travellers, as to its growth and production. It is said to be a native of the central parts of Thibet, where it is not made the subject of special culture, but grows spontaneously in sufficient abundance to supply all the demands for it as a drug. Its propagation is greatly assisted by the peculiar habits of the marmot. This little animal, in making its burrow, throws up a quantity of loose earth around it, and in the light soil thus formed, and in a country where marmots abound, the seeds of the rhubarb are said to germinate almost exclusively.

The roots of this plant are gathered in spring and autumn, and the natives, after removing the cortical part, cut them into small pieces, to facilitate the drying. A hole is cut through each piece, and they are then strung upon a small cord, and hung up in the air to dry, beneath a shed which protects them from the rays of the sun, and where they sometimes remain a whole year, before they are fit for sale.

Several kinds of Rhubarb are known in commerce. The most esteemed is *Turkey* or *Russia* rhubarb which was formerly brought to Europe through the Turkish provinces of Asia Minor, but is now received from Russia. It is brought from the native country to the frontier town of Kiachta in Siberia, where it is examined by a Russian government officer. The bad pieces are rejected and burned, and those of good quality are transmitted to Moscow and St. Petersburg, where they undergo a second examination, and any inferior pieces are picked out. On account of this careful selection of the drug, Russian rhubarb is always of good quality, and bears a higher price in the market than any other kind.

Russian rhubarb is offered for sale in pieces, each from one and a half to two inches broad, and two or three inches long. The shape of these pieces is sometimes flat, but more frequently conical. They are always perforated at one end, and occasionally there are other small holes observable, not passing completely through them, but made for the purpose of examining the interior of the specimens. The colour externally is of a bright golden yellow, owing to the pieces being covered with a powder, formed by their friction upon each other. Under the teeth good rhubarb feels gritty, owing to the presence of small crystals of oxalate of lime.

There is a second variety of rhubarb, which is perhaps obtained from the same source as the Russian, but it is known in commerce by the name of East India or Chinese rhubarb, being imported chiefly from Canton and Singapore. It is of inferior quality to the Russian rhubarb, because it is not subjected to the same careful and rigid examination, and portions of the root often come to us in a state of decay. The smell and taste of the Chinese rhubarb are also inferior to those of the Russian, though not in any marked degree, and the price it brings in the market is much lower. Thus while Russian rhubarb in bond is quoted in the official returns of the prices current at eight shillings and three pence per pound, the East India or Chinese is stated to bring only from two shillings and sixpence to four shillings.

Another variety, not superior in value to the Chinese, is the *Dutch-trimmed*, or *Batavian*, which is also brought from Canton or Singapore, and is considered as a distinct commercial kind.

A third variety of rhubarb is the English, which appears to be chiefly the roots of *rheum palmatum*. It was first extensively grown at Banbury in Oxfordshire, by Mr. Hayward, in 1780, and it is still cultivated to a large extent there. About this time very sanguine expectations were formed as to the qualities and cultivation of English rhubarb, and attempts were made to raise it for medicinal purposes, in various quarters; but though it has continued to be cultivated to some extent, its inferiority to the foreign varieties is universally admitted.

English rhubarb is found in the shops under two forms; either in pieces cut so as to resemble the Asiatic kinds, in which case it is called *dressed* or *trimmed*, or in cylindrical pieces, four or five inches long, and about an inch thick, called *stick* rhubarb.

The external appearance of English rhubarb is often deceptive, for it is a common practice to rub the pieces over with the powder of the Turkey rhubarb, in order t make it pass for the more valuable kind; but on removing this powder, the pink colour, light weight, and soft texture, sufficiently denote the inferior quality of the specimen.

The active principle of rhubarb may be regarded as unknown, the chemical analysis of this root being very imperfect. A yellow crystallizable principle has been obtained from it, which appears to be nothing more than the colouring matter of rhubarb, and not its active part. Rhubarb is soluble both in water and alcohol. The former takes up more of the purgative and less of the astringent principles than the latter, hence an infusion is a good method of exhibiting this medicine. The liquid preparations of rhubarb, however, should always be made by *infusion*, and not by *decoction**, as a high temperature promotes chemical decomposition of the drug.

Rhubarb from its astringency has been supposed to contain tannin, but this has not been satisfactorily proved by chemical experiment. The root contains a certain proportion of starch, and this is most abundant in the English sort, where it may be detected by a somewhat mucilaginous taste.

The medicinal action of rhubarb varies according to the dose administered. It is a gentle stomachic and astringent, when used in small quantities, as three or four grains, while in larger doses of from fifteen to thirty grains, it becomes a mild and easy laxative, devoid of irritating qualities.

The quantity of rhubarb imported into Great Britain in 1835 amounted to 81,100 lbs., and in 1836 to 122,142 lbs., of which in the former year 44,522 lbs., and in the latter 44,568 lbs. were retained for home consumption. The duty, being one shilling per lb., yielded a net revenue of 2220*l.* in the one year, and 2236*l.* in the other.

* In pharmacy, the terms *infusion*, *decoction*, and *tincture*, are in constant use. The object of all three processes is to obtain the soluble portions of a drug in a liquid form. By the first process the drug is steeped in water, either hot or cold: in the second process the drug is boiled in water: in tinctures, spirit alone is used, since many of the active parts of drugs, insoluble in water at any temperature, are soluble in spirit at all temperatures.

Morality, distinguished from, and independent of Christian faith, is nothing; but Christian morality is of the very essence, it is the true fruit, the sure testimony, the faithful companion, the glory and perfection, yea, the very life and soul of true Christian faith. Let us beware, that we do not confound things so different as worldly and Christian morality; as the works of the natural man and those of the disciples of Christ! Let us beware how we suppose that because a man cannot be saved by morality of one sort, therefore he can be saved without morality of the other sort; that because one who rejects the Gospel, will not be saved for being a moral man, therefore there is a hope of salvation for an immoral professor of the Gospel! Christian morality assumes to itself no merit—it sets up no arrogant claim to God's favour—it pretends not to "open the gates of heaven;" it is only the handmaid in conducting the Christian believer in his road towards them. Without it no man shall enter in: but they who disesteem and reject it are well apprized by God's word of the evil which they shall incur; when Christ shall command "the workers of iniquity," "the slothful and unprofitable servant to depart from him," and when "vengeance shall be taken in flaming fire on them that know not God, and obey not the Gospel of our Lord Jesus Christ."—Bishop Mant.

ELECTRICITY.

XIII.

Electrical Experiments.

The effects of accumulated electricity may be illustrated in a variety of ways. In some instances these effects depend on the nature of the substance operated upon; in others on its bulk, considered in relation to the quantity of electricity transmitted through it; but more frequently it is by the judicious combination of these, and other analogous conditions, that this class of phenomena can be most impressively exhibited.

We have already noticed, that under certain circumstances, electricity will force for itself a passage, not only over the surface but through the substance of a non-conducting body. This sometimes happens with a Leyden jar, either from communicating to it too powerful a charge, or when some part of the jar is thinner than it should be, the charge passing through the glass, and by the small fracture it occasions rendering the jar useless. In this case we have an example of the mechanical effects of electricity, and which may be further illustrated by the following arrangements.

Provide a piece of glass tube, about four inches long and half an inch in diameter; close one of its ends with a cork, and nearly fill the tube with olive oil; to the other end let a cork also be fitted, and a pointed wire passed through it, which must be bent at a right angle, so that the point may press against the side of the tube, a little below the surface of the oil. Let the wire be now connected with the conductor, and the machine set in motion, and on placing the finger, or any other conducting substance, against the tube, exactly opposite the point of the wire, a succession of sparks will pass through the glass, producing in it a very minute hole; and by changing the position of the wire, similar holes may be made in any required direction. In this experiment we observe, that the simple spark by being, as it were, concentrated, is sufficiently energetic to perforate the tube.

Let the *Universal Discharger** and *Balance Electrometer*† be so arranged, that they may form part of the circuit between the inside and outside coatings of a jar or battery: take a piece of glass tube, about six inches long, and a quarter of an inch in diameter, and fill it with water, stopping both ends very securely with corks: a piece of wire must be inserted in each of the corks, and the ends inside the tube brought within about half an inch of each other. Now place the tube on the table (1) of the discharger, connect the wires with the discharging train, and on passing a tolerably powerful charge through the tube it will be broken. In this case the breaking, or rather bursting of the tube, is occasioned by the sudden expansion of the water it contained; and in performing the experiment, it is advisable to spread a cloth immediately underneath the tube, that the water be not thrown over the other parts of the apparatus.

Having procured some pieces of very dry hard wood, about an inch long, and a quarter of an inch in diameter, let a small hole be drilled at each end, leaving in the middle a space equal to about three-eights of an inch not drilled. Fix pointed wires in the holes, and by means of them pass a charge through the wood, which will be thereby split asunder.

Place between the balls of the discharger a card,

* See *Saturday Magazine*, Vol. XIV., p. 116.
†Ibid. Vol. XIV., p. 236.

or a few folds of smooth paper; pass a charge through the apparatus, and the card or paper will be perforated. By increasing the power of the charge, several cards may be perforated at once, the hole being surrounded by a rough projecting bur, which gives to it an appearance of having been torn by the passage of a solid body.

A piece of loaf-sugar in the form of a wedge or cone being placed between the balls of the discharger, let the room be darkened, and a charge passed through the sugar, when it will instantly become phosphorescent; exhibiting a broad line of beautiful pale green light which will continue to glow for some time after the discharge has taken place. On repeating the charge the light will be renewed; and by a little skilful management in regulating the quantity of electricity and in disposing of the sugar, fragments of that substance, in a state of luminosity, will be scattered about the room.

In a similar manner to that just mentioned, chalk, and several other mineral substances, may be rendered luminous, the light varying in its colour according to the nature of the substance: in some instances it will be deep red, in others green, and in others white.

These examples must suffice to show what is meant by the *mechanical* effects of electricity. In the last-mentioned experiments the disruption of the substances is considered of less importance than their luminosity; but in every case the arrangements may be so varied as to produce one result with the same certainty as the other.—The success of the experiments will, of course, very much depend on the judgment and dexterity of the operator; so that the most minute directions will be of little avail without practice and experience.

Another pleasing illustration of rendering a body luminous by electricity is obtained by passing a comparatively feeble charge through three or four eggs, which will appear filled with light, and so transparent that the sizes and situations of the yolks will de distinctly visible. In the same way the effects of electricity upon several kinds of fruit, on balls of ivory and box-wood, and many other substances, may be exhibited; but the contrivances for varying the experiments in this department are so numerous that we can only make this passing allusion to them.

We must now mention some of the effects of accumulated electricity upon conductors. And here we remark with respect to the metals, which are comprised under one general term of good conductors, that they do not possess that property in equal proportions. Under ordinary circumstances, in consequence of the inconceviable rapidity with which electricity passes through metals, this peculiarity is overlooked. Nor is it possible to detect the difference of which we speak excepting by very accurate observations.

Whatever be the conducting power of a metal, a piece of wire for instance, if its size be so reduced that it operate as an impediment to the passage of the electricity, there will be a visible disturbance in the arrangement of the particles. By increasing the quantity of electricity, or by still further reducing the wire, it will be heated red-hot, and having attained that point a very small addition to the quantity of electricity will be sufficient to fuse the metal; scattering the molten globules in a state of vivid combustion to a considerable distance.

It demands especial notice that the heat evolved by the transmission of electricity through metallic wires affords an exact indication of the quantity employed; for without reference to the space over which the electricity is distributed, it is found that the same quantity will invariably produce corresponding results on wires of the same sizes and lengths. It matters not, therefore, whether we use a single jar or a large battery; for, provided the quantities are equal, we may be quite certain that the effects in each case will be exactly alike.

The experiments connected with the fusion of metals are exceedingly interesting, furnishing abundant opportunities for testing the accuracy of Mr. Harris's *unit-jar**, by means of which, in conjunction with another ingenious piece of apparatus, that gentleman has obtained the results as to the relative conducting properties of metals, which are set forth in the following table:—

	Ratios of Resistance.	Ditto of Heat evolved.
Silver	1	6
Copper	1	6
Gold	1½	9
Zinc	3	18
Platinum	5	30
Iron	5	30
Tin	6	36
Lead	12	72
Brass	3	18

In exhibiting the effects of electricity upon metals, it is necessary to employ a jar or battery, containing on each side at least two square feet of coating. Iron is the metal most conveniently operated upon, and for the purposes of popular illustration it is prepared in the form of a very fine flattened wire, which can be obtained at the philosophical instrument makers', under the name of watch-pendulum wire.

Supposing a single jar or battery, of the size above mentioned, to be used, it is desirable that the discharging train be as short as possible. The balls being removed from the discharger, and forceps fixed in their place, let a piece of wire, about two inches long, be attached to the instrument. On passing a charge through the wire, it will probably be found that the quantity of electricity is insufficient, and this is very likely to be the case, even when the charge has been increased to the utmost limit of what the jar or battery will bear. The wire must now be reduced in length, say to an inch and a half, and then perhaps the same charge will heat it red-hot, but if not, its length must be still further reduced, until at last the desired effect is accomplished. By means of a very large battery, it is possible to fuse from six to sixty inches of wire; but it must be remembered that a very trifling difference in the size of a wire will cause disappointment, if such differences be not taken into account in preparing the experiments. For ordinary occasions we find it most convenient to use one large jar, containing on each side about two and a half square feet of coating; a little attention enabling the operator to produce with it a regular series of results, from a state of dull redness to that of the most brilliant coruscation. The wire we use is the finest that can be obtained of the kind already described. In selecting a piece of wire, and in fixing it to the discharger, we must take care that there be no bends or sharp angles in it. After every discharge we must avoid handling the apparatus, until we have ascertained that no residual charge remains in the jar, and which is more likely to happen with these than any other experiments.

* See *Saturday Magazine*, Vol. XV., p. 28.

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